RED WOLF MANAGEMENT SERIES
TECHNICAL REPORT NO. 2

A STRATEGY FOR ESTABLISHING AND UTILIZING RED WOLF POPULATIONS ON ISLANDS

U.S. Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

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BY

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Introduction and Background

The reintroduction of the endangered red wolf to selected mainland areas within its historic range is the only means by which the species can be recovered. The Red Wolf Recovery Plan calls for the establishment of three self-sustaining populations before the species could be considered for possible down-listing to threatened status. The Alligator River National Wildlife Refuge reintroduction project in North Carolina will hopefully develop into the first successful mainland population of red wolves. Development of other major sites, however, will be a major effort that likely will span long periods of time. To enhance the probable success of future reintroduction efforts, it is imperative that a supply of vigorous and healthy animals that are as wild as possible be available. Although the Alligator River refuge project is utilizing captive-born-and-reared red wolves, the processes being employed to "train" these animals to fend for themselves in the wild not only is costly and time consuming, the efficacy of such efforts at this point are inconclusive. Two feasible strategies are available to the program to ensure maximum utility in selecting future animals for reintroduction purposes. The first involves changing the day to day captive breeding project to provide for a more "wild" captive-born-and-reared animal. The other strategy, and the one that will be discussed in this report, involves the use of captive pairs of red wolves released onto relatively small, secure islands for breeding and eventual capture of resulting wild offspring for use in mainland reintroductions.

Requirements of the Species

The red wolf is an opportunistic predator, and as such should be able to adjust to differing habitats and circumstances if protected from man. This premise was borne out during the 1978 experiment on Bulls Island, SC (Carley, 1981). During this 1-year study, a pair of wild caught red wolves were acclimated and released onto Bulls Island, a 5,000-acre component of the Cape Romain National Wildlife Refuge. Telemetry studies indicated that the pair settled into their island environment and prospered, and indications were that the female gave birth to a litter of pups, although none survived. After eleven months the pair was recaptured and placed back in the captive breeding program. An evaluation of this experiment revealed that wild caught red wolves could be relocated to an entirely new environment, acclimated, and then remain within a well-defined land mass, such as an island. Bulls Island, as small as it is, maintained a pair of wolves because it had an abundant prey base and human interactions were negligible.

Food Requirements

Several studies conducted on those remnant red wolves found in Louisiana and Texas during the 1970s (Shaw, 1975; Carley, 1975) indicated an almost exclusive preference for small mammals. The 1-year study of the Bulls Island wolves essentially verified these earlier findings, but deer (Odocoileus virginianus), fox squirrel (Scuirus niger) and American coot (Fulica

americana) were added to the list. An annual bow hunt is permitted on the island, and it is thought that crippled or dead deer were utilized by the wolves.

Presence of Other Canids

Areas free of coyotes are obviously preferable for a red wolf reintroduction, but those areas that sustain low-to-moderate canid populations should not necessarily be ignored. If needed, canid removal or reduction in numbers could be undertaken prior to a release of wolves. If wolf pair bonding is maintained, a small family unit of red wolves probably would not only maintain their genetic integrity in competition with other canids, but could displace these canids within their home range over a period of time.

Coexistence With Man

Success or failure of a wolf reintroduction is largely dependent on the attitude of the human population of the area. Initially, it is thought that island reintroductions should be limited to Federal properties that are relatively remote and have controlled public access. Ideal candidate sites are lands of the National Wildlife Refuge System.

Island Strategy

The utility of any one island to the red wolf program will depend on available acreage, prey base, habitat types, ownership, human habitation, and/or human use, and susceptibility of the island to overtopping by storm surges or hurricanes. As mentioned earlier, federally-owned properties are probably the best source of islands along the south Atlantic seaboard and gulf coastal states. Island components of the National Wildlife Refuge System are the most feasible, with National Park Service islands next in preference.

Human use of a candidate island must be studied in detail. Bird-watching throughout the year, sport fishing, and bow hunting for deer on Bulls Island did not interfere with red wolf habits after their release there, indicating an island need not be placed off limits to human usage. Before being permitted to hunt on Federal property where red wolves occur, hunters should receive specific instructions about the wolves and penalties for harassing or killing the animals.

If an adequate prey base is determined to be present, and if the other biological and social requirements are satisfied (including full coordination with the state wildlife resources agency), then a public meeting should be held in the proximity of the project. Misinformation about such a potentially sensitive project can dramatically undermine public support. Public attention to an island project should underscore the real purpose of the reintroduction (which would be simply to serve as a reservoir of young red wolves that will be utilized in other projects).

The acclimation pen site should be in a remote portion of a given island, off limits to the public when wolves arrive. Pen site selection should also take into account accessibility for project personnel to monitor, feed, and water the animals for the 6-month acclimation period. The acclimation process is very critical, and major decisions must be made early on regarding security of the site, public awareness of where the site is, and public reaction to the wolves being there. Having to provide security on a round-the-clock basis during the 6-month acclimation period adds a dimension to the project that can be very expensive. The Bulls Island project did not require close security because of the control of public entry onto the island. The Alligator River Refuge project, however, has required security due primarily to the substantial distances involved from refuge headquarters to the pen site, and the ease of public access to most portions of the refuge by motor vehicle or boat.

Wolves should be transported to the island acclimation pen in October or November, and subsequently released in May or June of the following year. Specifications for pen and acclimation techniques are suggested in several publications (Carley, 1983; Parker, 1986).

Monitoring of released red wolves via telemetry will indicate early on if the animals are adapting to their new environment. The placement of dead prey in the proximity of the pen site will assist in the transition to a completely wild situation.

Rearing and Capturing Wild Born Young Wolves

Assuming the wolves acclimate, periodic electronic monitoring will verify their locations. Scat collections will assist in determining what prey species are being utilized. Telemetry monitoring should be intensified during the months of April and May to determine if the female is denning. This will become obvious when the location fixes of the female are determined to be essentially stationary for an extended period of time. Presence of pups can be later determined by size of scats and paw prints in sand or soft dirt along with adult prints. If possible, a determination of the number of pups through visual observations should be attempted. Late evening and early morning searches for adults and pups might prove feasible, especially along isolated beaches or possibly at pre-baited "bait stations." Howling surveys would be useful in the fall to determine if offspring are traveling with the adults, and will give an indication as to how many animals are present (McCarley, 1978; Carley, 1973).

Little factual data is available regarding litter size in wild red wolves. Information from the captive breeding program indicates that litter sizes range from two to eight pups with an average of 4.6. Under wild conditions, average litter size will probably approximate that of captive animals, but survival of young will no doubt be lower than in captivity. The influence of canine parvo varis on young wild red wolves is yet to be determined, but may well be a

limiting factor. Probably the best that can be hoped for would be two young per litter surviving to adulthood.

Utilization of young wild born and reared red wolves would be oriented at infusion of animals into the Service's captive breeding program, and as stock used in mainland reintroduction attempts. As mentioned earlier in this report, the use of wild wolves in reintroduction efforts would logically enhance the chances of success of these projects. Based on what factual data is available, it would appear that a small island project (an island of 3,000 to 7,000 acres), inhabited by one pair of adult red wolves, could after several years, yield two or perhaps three young wild wolves per year that could be utilized in the recovery program.

Equipment and procedures for capturing young wolves will vary from island to island, depending on topography, cover, and other wildlife inhabiting the island. In most cases, modified, No. 4 Newhouse steel leghold traps will be employed. These traps would cause little if any tissue damage to the animal's leg or foot and each would have 1-inch diameter tabs attached by wire, with each tab containing .8g of the oral tranquilizer Propriopromazine (Diamond Laboratories, Inc). The tranquilizer would be ingested by the wolf when it bites at the trap (Balser, 1965). Personnel would check traps each morning to reduce as much as possible potential injury to caught wolves. The traps should always be set utilizing a "drag", never firmly attached to an immovable object. Caught animals will be muzzled, checked for injuries, and transported to a central holding kennel. Young, inexperienced wolves are relatively easy to capture utilizing this technique. The adults, if accidently caught, will soon become extremely trap shy.

Other techniques for capturing young wolves include using tranquilizing baits, containing Propriopromazine. Such baits can be small animal carcasses or tallow cubes. However, this procedure carries the risk of attracting other nontarget species such as foxes and bobcats. In addition, dense cover could preclude finding a tranquilized red wolf. Small island situations would also be conducive to darting young animals from ambush, utilizing gas operated rifles firing darts that inject the tranquilizer directly into muscle tissue. The most commonly used drug for this purpose is a combination of Rompun (large animal dose, 100 mg/ml, injectable, Chemagro) and ketamine-hydrochloride (Vetelar, Park Davis or Ketaset, Bristol) with enough sterile water to fill the chamber of the dart. The Rompun tranquilizes the animal fairly fast while the ketamine-hydrochloride tends to lengthen the tranquilization period (Cornely, 1979). Once injected, the drugs require about five minutes to take effect, and animals will be under the influence of the drugs for 30 to 90 minutes depending on weight, condition, and other factors.

"Training" of Captive-Born Wolves

A strategy that might be employed if circumstances dictate would be to acclimate and release several pair of young, captive-born wolves onto an island

situation for "training" purposes, preferably during the spring and summer (1- or 2-year-old animals) and then recapturing them for a mainland reintroduction. The advantages in this strategy are the usage of the capture collar to retrieve animals when needed without a great deal of effort and without risks of trap injury. This capability also means that fewer project personnel would be needed to capture animals.

Animals selected for this strategy must still undergo an acclimation process and be carefully monitored after release. The intensity of monitoring would depend on the island situation. An island a great distance from the mainland and separated by miles of open water is more likely to contain wolves, whatever conditioning is employed; but one which is separated from the mainland by relatively narrow tidal guts and extensive salt marsh is a more critical problem.

Conclusions

Gray wolves have demonstrated their ability to prosper on island situations, including both naturally occurring populations (Mech, 1966) and introduced populations (Merriam, 1964). There is no reason to doubt the ability of red wolves to do equally well in such situations. The Bulls Island experiment in 1978 lends support to this thesis.

This report has been prepared as a guide to developing small populations of red wolves on a few carefully selected islands within the Region 4 work area of the U.S. Fish and Wildlife Service. Such island populations, after several years, would yield young, vigorous, wild red wolves that would be ideally suited to either major mainland reintroductions or to enhance the genetic vigor of the Service's captive breeding program. This technique could be described as a halfway house for red wolves.

Perhaps the greatest attribute an island strategy would yield is simply the amount of biological information that would be gained. This, plus the enhancement of major mainland reintroductions via the use of wild wolves, makes island strategies of major importance in the hoped-for recovery of the red wolf.

Islands that meet the requirements as set forth in this report include Cape Romain National Wildlife Refuge (Bulls Island), Savannah Coastal Refuges, Georgia (Blackbeard Island), and St. Vincent National Wildlife Refuge, Florida. Horn Island, a component of the National Park Service Gulf Islands National Park, would offer great opportunity. If and when an island project is initiated, it must be kept in mind that it would likely be two years before any animals are ready for capturing and use in the red wolf program. Thus, long-term planning is vital to maximize the positive aspects of this strategy.

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Addendum

Establishing a Red Wolf Population on Cape Romain NWR, South Carolina

It is proposed that one pair of captive, adult red wolves be shipped via air cargo from Tacoma, Washington, to Charleston, South Carolina, in late October 1987, then transferred to the Cape Romain National Wildlife Refuge (Bulls Island); fitted with temporary transmitter collars; and released into a 50' x 50' acclimation pen. A temporary caretaker position would be established, based on a 6-month acclimation period assignment, to provide security and necessary care for these animals. A rigid protocol covering a rapid transition from commercial dog food to native prey species would be required. The wolves would be allowed to breed during the acclimation period, and shortly after pups are born the pen door would be opened. If offspring are not evident, the door would be opened sometime during May 1988. Prior to release, each animal would receive a final health check and the adults would be fitted with 3-M capture collars.

Dead prey would be left in the proximity of the pen for a period of time to ease the transition from captivity to the wild. Animals would be closely monitored via conventional radio tracking procedures.

Offspring born during the spring of 1988 would be available for the project after six months. Therefore, animals could potentially be available during the winter of 1988-89.

This initial island project could be carried out for approximately $21,000, as follows:

Air transportation of two wolves to Charleston from Tacoma, WA	$ 500.00
Temporary transmitter collars (2)	300.00
Receiver (1)	1,200.00
Antennas (4) yagi type	300.00
3-M Capture Collars (2)	2,000.00
3-M Signal generator (1)	600.00
Catch poles, capture nets, shipping kennels (2 ea.)	300.00
Veterinary care	600.00
Palmer capture gun, darts, etc.	400.00
Drugs	50.00
Dog food	100.00
Aircraft tracking (if required)	1,000.00
Gasoline for FWS tracking vehicle	800.00
Miscellaneous repairs and materials	2,500.00
Salary for one GS-5 temporary, 6-month appointment	10,000.00
Total	$20,650.00

There would be substantial opportunities for volunteer services. Qualified volunteers could assist with the radio tracking of the wolves. After the animals have adjusted to the island, tracking frequency could be extended to only weekly checks by refuge personnel during routine visits to Bulls Island. The red wolf project leader would be assisted by one refuge staff member in

capturing offspring. Under normal circumstances, it should cost about $2000 to capture, handle, and transport one wild red wolf produced under the preceding strategy.

Before any of the preceding actions are undertaken, it would be necessary to secure the cooperation of the South Carolina Wildlife and Marine Resources Commission. In addition, local support would have to be assessed via the hosting of one or more public meetings, probably in Mount Pleasant and/or McClellanville. Prior to this, a detailed analysis of the proposal should be presented to the Berkeley County Commissioners, members of the South Carolina Congressional delegation, and key personalities in the general project area.